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THE GENUS *FREYCINETIA* (PANDANACEAE)
IN THE SOLOMON ISLANDS*

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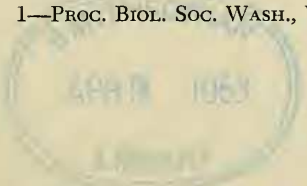
In attempting to identify a relatively small number of specimens of *Freycinetia* collected by the writer in the Solomon Islands in 1957, it became apparent that a review of the known species was necessary, and that two apparently undescribed species were represented. This paper is an outcome of this review, and includes descriptions of two species proposed as new, bringing up to fourteen the total number of species reported from this region.

Only one species of Section *Oligostigma* as yet is known from the Solomon Islands, namely *Freycinetia tessellata* Merrill & Perry. This is rather unusual, since species of this section are both numerous and apparently common in New Guinea. In this respect the Solomon Islands may be grouped with Polynesia in a geographic division of the genus by sections, since only species of Section *Freycinetia* occur in Polynesia. The type species of the genus is *Freycinetia arborea* Gaudichaud, which is endemic to the Hawaiian Islands; this was included in the Section *Pleio-stigma* Warburg, which must now be known as Section *Frey-cinetia*, in accordance with the International Code of Botanical Nomenclature, Article 22 of the 1956 edition.

KEY TO SPECIES OF *FREYCINETIA* IN THE SOLOMON ISLANDS

- I. Stigmas mostly 3-10 or more per berry. Section *Freycinetia*
 - A. Syncarps elongate, cylindric.
 - 1. Inflorescences terminal.

*This is the fourth in a series of studies of plants of the Solomon Islands. The first appeared in Bot. Not., 112 (3): 372-376, 1959; the second in Brittonia, 13 (2): 212-224, 1961; the third in Proc. Biol. Soc. Wash., 75: 25-32, 1962. I am indebted to the Curator of the Arnold Arboretum Herbarium of Harvard University for the opportunity of examining types and other specimens mentioned herein.



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- a. Auricles markedly pectinate; leaves only 15–20 cm long, about 9 mm broad; pedicels distally scaly-scabrid. *F. pectinata*
 - b. Auricles not as above; leaves mostly 10–30 mm broad; pedicels various.
 - a'. Leaves mostly longer than 30 cm, sometimes much longer.
 - Seeds narrow, slightly curved, with a broad raphe, but lacking strophiole. *F. solomonensis*
 - Seeds ellipsoid, with a distinct strophiole.
..... *F. bicolor*
 - b'. Leaves mostly 15–30 cm long.
 - Syncarps about 4 cm long and 1 cm in diameter; pedicels about 4 cm long; stigmas 3–6, mostly 4–5, cushion-like, distinct.
..... *F. anomala*
 - Syncarps about 2.5 cm long and 1.2 cm in diameter; pedicels up to 5 cm long; stigmas 4–8, confluent. *F. oligodonta*
 - 2. Inflorescences lateral, subtended by distichous vegetative bracts. *F. funicularis*
- B. Syncarps globose, ovoid, ellipsoid, or shortly oblong.
- 1. Pedicels scabrid at least in part.
 - a. Leaves 13–18 cm long, 2.5–3.5 cm broad, the margins almost unarmed. *F. decipiens*
 - b. Leaves mostly about 60 mm long and 1.5 cm broad, armed in part.
 - a'. Auricles splitting lengthwise into fibers; leaves distinctly coriaceous; berries relatively few per syncarp, rather short and thick, with plump seeds 0.6 mm in diameter. *F. nesiotica*
 - b'. Auricles splitting transversely into fragments; leaves less markedly coriaceous; berries numerous per syncarp, about 12 mm long, obclavate to sublageniform, the pileus 4–5 mm long; seeds about 0.4 mm in diameter. *F. membranacea*
 - 2. Pedicels quite smooth and glabrous.
 - a. Leaves 2–6 cm broad.
 - a'. Leaves 12–17 cm long, 5–6 cm broad.
..... *F. marantifolia*
 - b'. Leaves mostly 20–50 cm long and 2–5 cm broad.
 - Leaves about 35 cm long and 3.5–5 cm broad, at base abruptly tapered into a narrow pseudo-petiole; pedicels about 7 cm long.
..... *F. petiolacea*

Leaves 20–50 cm long, 2–4 cm broad, not tapered at base as above; pedicels about 5 cm long.

..... *F. humilis*

b. Leaves considerably narrower, up to 2 cm broad.

a'. Syncarps shortly oblong to subpyramidal.

Leaves mostly 25–30 cm long and 1.3 cm broad; syncarps about 2.5 cm long and 1.2 cm in diameter, mostly oblong. *F. oligodonta*

Leaves mostly 18–24 cm long, narrowly linear-lanceolate; syncarps about 3.5–4.5 cm long and 1.6–1.7 cm in diameter, often subpyramidal. (Known only from New Britain to date.) *F. novo-pomeranica*

b'. Syncarps elliptical-ovoid, about 3 cm long and 2 cm in diameter; leaves about 18 cm long and 2 cm broad. *F. divaricata*

II. Stigmas 1–3, rarely 4–5 per berry. Section *Oligostigma*

One species, with leaves 80–120 cm long and 6–7 cm broad.

..... *F. tessellata*

ENUMERATION

Section *Freycinetia*

1. *Freycinetia anomala* Merr. & Perry in J. Arn. Arb. 20: 152, pl. 1, f. 8, 1939.

Type locality: San Cristoval Island, Hinuahaoro, 900 m (*Brass* 2886).

2. *Freycinetia decipiens* Merr. & Perry in J. Arn. Arb. 20: 154, 1939.

Type locality: San Cristoval Island, Star Harbor, 50 m (*Brass* 3113) (Type: *Brass* 3138).

3. *Freycinetia divaricata* Merr. & Perry in J. Arn. Arb. 20: 154, pl. 1, f. 2, 1939.

Type locality: Florida Islands, N'gela, Olevuga Island, lowland forest (*Brass* 3480).

Malaita Island: Kwara'ai District, Kwalo, 600 m (rainforest climber, syncarps small, ovoid, red when mature, with berries 6 mm long, pileus rounded, stigmatic area raised on a substylose rostrum with 1–5 but mostly 3–4 stigmas; local name "ari-ari"), 24 Sept. 1957, *Stone* 2359 (BISH, US). Some leaves from this collection are only 7.5 cm long and 1.1 cm broad, while in the type they are mostly 16–18 cm long and 1.5–2 cm broad. The syncarps here are slightly smaller, up to 2.5 cm in diameter. It should be noted that my collection was from a fallen trunk in a sunny clearing; some of the plants had withered, others were stunted. The specimen bears a branch which nearly matches the type, but others are smaller in all respects. No significant differences occur, however, and the berries and seeds are very similar. Rarely there will be found some berries with 5 stigmas, and sometimes with only 1 or 2 stigmas; most have 3 or 4 stigmas.

From this it may be appreciated that the species does not fit clearly into either section of the genus, and could just as well be considered a member of Section *Oligostigma*.

4. *Freycinetia funicularis* (Savigny) Merr., Interpret. Rumph. Herb. Amboin. 83, 1917; Merr. & Perry in J. Arn. Arb., 20: 155, 1939.

Type locality: Amboina.

Recorded from San Cristoval Island by Merrill and Perry on the basis of collections (No. 3016, 3017) by Brass.

5. *Freycinetia humilis* Hemsley in Kew Bull., 1896: 164, 1896; Warburg in Pflanzernr. 3 (IV.9): 40, 1900; Martelli in Webbia 3: 311, 1910.

Type locality: Fauro Island (*Guppy* 323).

6. *Freycinetia marantifolia* Hemsley in Kew Bull. 1896: 164, 1896; Warburg in Pflanzernr. 3 (IV.9): 36, 1900; Martelli in Webbia, 3: 312, 1910; Merr. & Perry in J. Arn. Arb. 20: 154, 1939.

Type locality: Fauro Island (*Guppy* 324).

Reported from San Cristoval Island (*Brass* 2932) and Ysabel Island (*Brass* 3230) by Merrill and Perry.

Ysabel Island: Southwestern end, in forest just back of Sesedo village, near sea-level, a vine climbing on *Pandanus nemoralis*, local name "sokite," 15 October 1957, *Stone* 2485 (BISH).

7. *Freycinetia membranacea* Merr. & Perry in J. Arn. Arb. 20: 156, pl. 1, f. 5, 1939. (Fig. 3).

Type locality: Bougainville Island, Siwai (*Waterhouse* 168).

Ysabel Island: Southwestern end, in swamp-forest near Nagolau village, a vine climbing in mangrove trees, leaves 60 cm long and 1.1 cm broad, syncarp 3, terminal, oblong; 12 October 1957, *Stone* 2475 (BISH). Seeds c. 1.6 mm long, with a broad white raphe; strophiole lacking.

8. *Freycinetia nesiotica* Merr. & Perry in J. Arn. Arb. 20: 156, pl. 1, f. 6, 1939.

Type locality: San Cristoval Island, Hinuahaoro, 900 m alt. (*Brass* 2929).

9. *Freycinetia oligodonta* Merr. & Perry in J. Arn. Arb. 20: 155, 1939.

Type locality: San Cristoval Island, Hinuahaoro, 900 m alt. (*Brass* 2930).

10. *Freycinetia pectinata* Merr. & Perry in J. Arn. Arb., 20: 153, 1939.

Type locality: Ysabel Island, Kakatio, 900 m alt. (*Brass* 3247).

11. *Freycinetia petiolacea* Merr. & Perry in J. Arn. Arb. 20: 157, 1939.

Type locality: Ysabel Island, Kakatio, 900 m alt. (*Brass* 3256). This species was also collected on San Cristoval Island (at Hinuahaoro: *Brass* 2931) and on Bougainville Island (at Koniguru, Buin: *Kajewski* 2147).

The leaves, which are narrowed toward the base and appear almost as if petiolate, are unlike those of any other species that I have seen except *Freycinetia caudata* Hemsl. of Fiji.

12. *Freycinetia bicolor* B. C. Stone, sp. nov. (Fig. 1).

Scandens; caulis robustis; folia lineari-ensiformia, conferta, erecto-

patentia, apice anguste sensim acutata, ca. 70 cm longa et 1.6–1.9 cm lata, basi compressi-amplexentia, margine ad basim apicemque serrato-dentata, cetera laevia, costa media dorsaliter in parte superiore serrato-dentata, auriculis conspicuis, deciduis, ad 7 cm longis et 5 mm latis, scarioso-membranaceis, fragilibus; inflorescentia terminalis, pedunculata, syncarpis 3 oblongo-cylindraceis, ca. 9.5–10.5 cm longis et 3–4 cm diametro, pedicellis laevibus ca. 4.5 cm longis et 0.4 cm crassis subteretibus, spathis caducis; baccae supra coriaceae infra ($\frac{2}{3}$) carnosae, ca. 13 mm longae et 3–4.5 mm crassae, apice aurantiacae, acuminatae, angulatae, truncatae, parte inferiore seminiferis rubrae, areola stigmatica truncato annulo nitente cincta, stigmatibus 5–10, vulgo 6–8, seminibus ellipsoideis ca. 0.9 mm longis, raphe et strophiole conspicuis, cellulis raphidophoris in raphem nitentibus, strophiole usque ad 0.1 mm lato.

Type: In the herbarium of the B. P. Bishop Museum (Honolulu), collected in a mangrove swamp near Sesedo village on the southwestern coast of Santa Ysabel Island, British Solomon Islands, near sea-level, 15 October 1957, by Benjamin C. Stone (No. 2484).

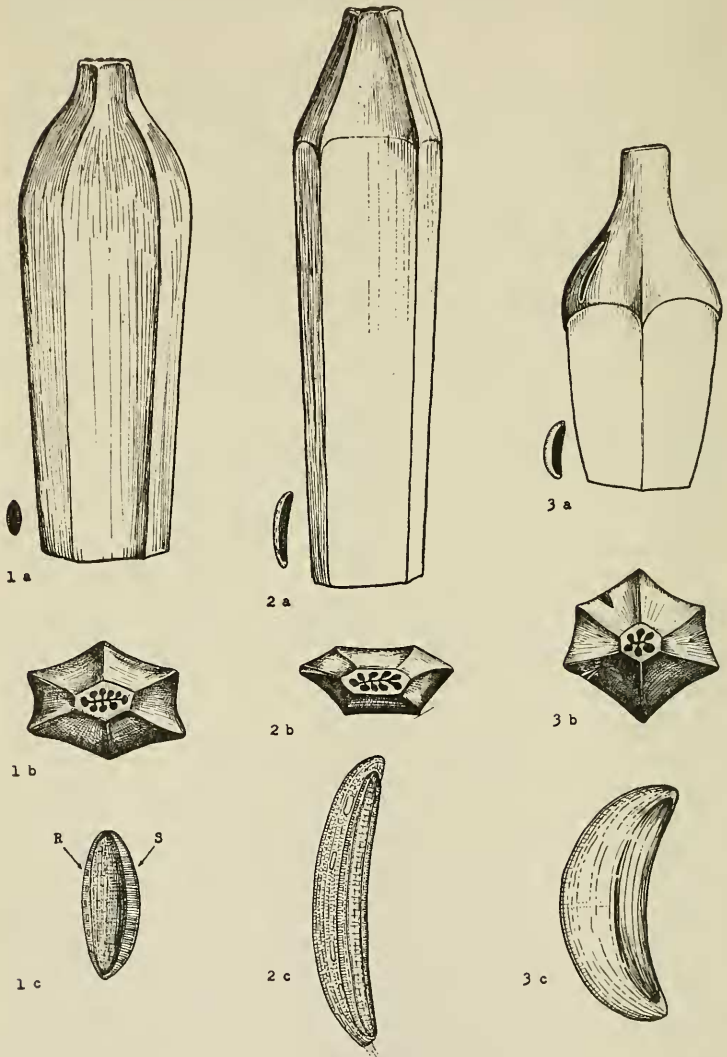
This species is close taxonomically to the following (*F. solomonensis*) and occurs in the same locality. It is also similar to *Freycinetia percostata* Merr. & Perry of New Guinea, but differs from that species in being generally smaller (even in the seeds, which are about 1.3 mm long in *F. percostata*). From *Freycinetia solomonensis* the present species differs chiefly in the smooth pedicels, the slightly shorter and broader berries, and most conspicuously in the very different ellipsoidal strophiolate seeds.

The name indicates the color of the ripe berries, which are reddish-orange in the rigid apical portion and dark red in the lower fleshy seed-bearing two-thirds.

13. *Freycinetia solomonensis* B. C. Stone, sp. nov. (Fig. 2).

Liana scandens, subrobusta, caulibus ad 12 mm diametro, folia erecto-patentia, conferta, basi amplexentia, 70–85 cm longa, 17–22 mm lata, anguste ensiformi-linearia, apice anguste sensim acutata subflagellata, basi ad 3.5–4 cm lata caulem amplexente, margine apicem versus minute serrato-denticulata, basin versus (ca. 5–10 cm) serrato-dentata, costa media dorsaliter apicem versus serrato-denticulata, ceterum laevia, auriculis ad 7 cm longis et 5 mm (vel ultra?) latis, deciduis, margine integris (?); inflorescentia terminalis, pedunculata, syncarpis 3 cylindraceis, 6.5–11 cm longis et 3–4 cm diametro (vel usque 15 cm longis?), pedicellis 4–5 cm longis et 4–7 mm crassis, perminute scabridulis, in angulis scabridis, dentibus scabridis erecto-antrorsis ca. 0.2–0.3 mm longis; baccae 15–17 mm longae et 3–4 mm crassae, apice coriaceae, pileo ca. 4–5 mm longo, anguloso, anguste pyramidato, apice truncato, areola stigmatica annulum pallidum perangustum cincta, stigmatibus 5–11, vulgo 6–8, seminibus sublunulatis, angustis, ca. 2 mm longis, rubro-miniatis (vel violaceis?), raphe alba ca. 0.15 mm lata, cellulis paucis argenteis raphidophoris linearibus nitentibus, strophiole nullo.

Type: In the herbarium of the B. P. Bishop Museum (Honolulu), col-



FIGS. 1-3. Berries and seeds of *Freycinetia*. 1, *F. bicolor*, sp. nov., 2, *F. solomonensis*, sp. nov., 3, *F. membranacea* Merr. & Perry. In all cases, a—berry in profile, $\times 5$; b—berry in top view, $\times 5$; c—seed, $\times 20$. 1 and 2 from type specimens; 3 from Stone 2475. R = raphe; S = strophiole.

lected in lowland forest just back of Sesedo village, on the southwestern coast of Santa Ysabel Island, British Solomon Islands, near sea-level, 15 October 1957, by Benjamin C. Stone (No. 2484-a).

Additional specimen examined: Bougainville Island: Kugumaru, Buin, alt. 150 m (climbing up tree; syncarps ca. 6.5×3.5 cm), 6 July 1930, Kajewski 1830 (BISH).

Very close to *Freycinetia percostata* Merr. & Perry, described from New Guinea; but with somewhat fewer stigmas per berry, and greatly different seeds, which lack a strophiole. In habit, syncarp-shape, and berry-shape, there is little difference between these species, although the leaves are here narrower (1.7–2.2 cm rather than 2.5–3 cm broad), and the middle region of the leaf is unarmed; the berries are also slightly shorter, and not so uniformly laterally compressed.

Sect. *Oligostigma* Warburg

14. *Freycinetia tessellata* Merr. & Perry in J. Arn. Arb. 20: 149, 1939.

Type locality: Ysabel Island, Maruto, 300 m alt. (*Brass* 3384). Also reported from Meringe, Ysabel Island (*Brass* 3176), and from San Cristoval Island (Star Harbor: *Brass* 3122).

Additional specimen examined: Santa Ysabel Island: southwestern end, just inland of Sesedo village, in lowland forest (a woody broad-leaved liana in forest; syncarps 3–4, cylindric, bright red, with very numerous filiform berries with generally 2–4 black stigmas each), 14 October 1957, Stone 2481 (A, BISH, US).